Science Standards of Learning

Sample Scope & Sequence

Grade 2

Commonwealth of Virginia
Department of Education
Richmond, Virginia
2003

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Preface

As an additional resource to help school divisions develop curricula aligned to the 2003 Standards of Learning, the Virginia Department of Education has developed sample scope and sequence documents for kindergarten through grade eight and for core high school courses. These sample documents provide guidance on how the essential knowledge, skills, and processes that are identified in the Standards of Learning and the Standards of Learning Curriculum Frameworks may be introduced to students in a logical, sequential, and meaningful manner.

These sample scope and sequence documents are intended to serve as general guides to help teachers and curriculum developers align their curricula and instruction to support the Standards of Learning. Each sample document is organized around specific topics to help teachers present information in an organized, articulated manner. Also included are correlations to the Standards of Learning for that curricular area for a particular grade level or course, as well as ideas for classroom assessments and teaching resources.

The sample scope and sequence documents are not intended to prescribe how curriculum should be developed or how instruction should be delivered. Instead, they provide examples showing how teachers and school divisions might present to students in a logical and effective manner information that has been aligned with the Standards of Learning. School divisions that need assistance in developing curricula aligned with the Standards of Learning are encouraged to consider the sample scope and sequence guides. Teachers who use the documents should correlate the content identified in the guides with available instructional resources and develop lesson plans to support instruction.

The *Science Standards of Learning Sample Scope and Sequence* and the *Science Standards of Learning Curriculum Framework* can be found in both PDF and Microsoft Word file formats on the Virginia Department of Education's Web site at http://www.doe.virginia.gov/VDOE/Instruction/sol.html.

Introduction

The following sample scope and sequence is based on the essential content, skills, and processes developed for each Second Grade standard in the *Science Standards of Learning Curriculum Framework*. It is not intended to be a complete or exhaustive set of all that students should master at this level, but instead the scope and sequence organizes a core of key skills, content, and processes around basic topic areas.

The topic areas generally correspond to individual standards; however, certain standards are reorganized and grouped with components of other standards to comprise meaningful instructional clusters. The various topics are not intended to require equal instructional time. Additional objectives have not been developed, and no attempt has been made to transition or further explain the content. Additional information may be obtained from the overview and introductory sections of the Second Grade *Science Standards of Learning Curriculum Framework* (http://www.doe.virginia.gov/VDOE/Instruction/Science/sciCF.html).

An important and consistent thread among these organizational topics is the application of inquiry skills throughout. Students should have an opportunity to master the various science concepts in each topic area in the context of active learning and inquiry processes. The focus on inquiry is further reinforced by having the first topic in the scope and sequence as a discrete treatment of the science skills; however, a discrete treatment is certainly not required. This represents only one way to organize instruction; there are many other valid and useful organizational schemes.

Effective science teaching requires assessing and understanding what students know and need to learn and then challenging and supporting them to learn it well. The array of effective assessment techniques that teachers can employ in the classroom goes well beyond traditional assessments, and science instruction lends itself well to alternative approaches such as portfolios, student self assessments, and short videotaped presentations. The assessments mentioned in the scope and sequence are intended to be general. It is the role of the local curriculum to develop a detailed review of what is most effective for the particular concept being developed.

The resources section included in this scope and sequence provides a brief sample of instructional resources and staff development materials that are generally available without charge. There is a significant body of commercially available instructional materials that correlates well with the Science Standards of Learning and is of very high quality. This document, however, does not include references to those materials.

Organizing Topic	Related Standards
Investigation Skills	**2.1**
Investigating the Weather	**2.6, 2.1**
Investigating the Effects of Seasonal Change	**2.7, 2.1**
Investigating Solids, Liquids, and Gases	**2.3, 2.1**
Investigating Magnets and Metal	**2.2, 2.1**
Investigating Plant Resources	**2.8, 2.7b, 2.1**
Investigating Life Cycles	**2.4, 2.1**
Investigating Habitats	**2.5, 2.8c, 2.1**

Organizing Topic	Essential Knowledge, Skills, and Processes	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Investigation Skills (A discrete introduction to specific science skills is not necessary as all of the inquiry skills should be incorporated within the following topical areas. Teachers may consider introducing some of these skills in isolation or coordinated with mathematics, English, and history instruction.)	**Students should be able to:** conduct simple experiments, make predictions, gather data from those experiments, repeat observations to improve accuracy, and draw conclusions. classify items, using two or more attributes such as size, shape, color, texture, and weight. differentiate among simple observations and personal interpretations. This requires students to comprehend what an observation is and apply the term in novel situations related to second grade SOL concepts. construct and interpret simple models (for example, weathering and erosion of land surfaces—2.7). analyze sets of objects, numerical data, or pictures, and create basic categories to organize the data (descriptive or numerical). construct and interpret picture and bar graphs with numbered axes depicting the distribution of data. use centimeters, meters, liters, degrees Celsius, grams, and kilograms in measurement.	2.1	Student demonstrations Classroom observations Student work Quizzes Tests	*Teaching and Learning the Basic Science Skills* videotape teacher training series, site guide: http://www.doe.virginia.gov/VDOE/Instruction/sol.html *Science SOL Curriculum Framework:* http://www.doe.virginia.gov/VDOE/Instruction/Science/sciCF.html

Organizing Topic	Essential Knowledge, Skills, and Processes	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Investigation Skills (continued)	use inches, feet, yards, quarts, gallons, degrees Fahrenheit, ounces, and pounds in measurement. judge which, if any, collected data in a small set appear to be unexpected or unusual.	2.1		

Organizing Topic	Essential Knowledge, Skills, and Processes	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Investigating the Weather	**Students should be able to:** observe and describe types of precipitation, including rain, snow, and ice (sleet and hail). observe and describe precipitation in terms of evaporation and condensation of water. observe and record daily weather conditions, such as sunny, cloudy, windy, rainy, or snowy. describe weather in terms of temperature, wind, and precipitation. measure and record weather data using weather instruments including a thermometer, rain gauge, and weather vane (standard English and metric measures). record and interpret daily temperature using a graph with numbered axes. observe and describe seasonal weather patterns and local variations. identify common types of storms. Examples include hurricanes, tornadoes, blizzards, and thunderstorms.	2.6	Student demonstrations Classroom observations Student work Quizzes Tests	NOAA Weather Education resources: http://www.education.noaa.gov/ Weather Channel Education resources: http://www.weather.com/education/ Virginia Earth Science Resource Page – Meteorology: http://vtso.geol.vt.edu/vesr/meteo/vesrmeteo.html

Organizing Topic	Essential Knowledge, Skills, and Processes	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Investigating the Weather (continued)	compare and contrast droughts and floods. evaluate the influence of daily weather conditions on personal activities and dress.	2.6		
	apply the 2.1 science skills in the context of the content of this topic.	2.1		

Organizing Topic	Essential Knowledge, Skills, and Processes	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Investigating the Effects of Seasonal Changes	**Students should be able to:**		Student demonstrations Classroom observations Student work Quizzes Tests	*Project WILD* activity guide: http://www.dgif.state.va.us/education/wildlife_education.html
	identify growth and behavioral responses of plants and animals to weather and seasonal changes. Examples of responses that are adaptive include migration, hibernation, and dormancy. identify animals that migrate, hibernate, or show other changes throughout the seasons or in the presence of adverse environmental conditions. evaluate the usefulness of camouflage in an animal's habitat (for example, coloration patterns in frogs). compare and contrast the responses of plants and animals to weather and seasonal changes. model the effects of weathering and erosion on the land surface.	2.7		
	apply the 2.1 science skills in the context of the content of this topic	2.1		

Organizing Topic	Essential Knowledge, Skills, and Processes	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Investigating Solids, Liquids, and Gases	**Students should be able to:**		Student demonstrations Classroom observations Student work Quizzes Tests	*Physical Science SOLutions* module: http://www.smv.org/pubs/index.html
	classify materials as to whether they are liquids, solids, or gases. measure the mass of solids and the volume of liquids in metric and standard English units. design an investigation to determine basic factors that affect the evaporation of water. examine and describe the transformation of matter from one state to another, i.e., solid water (ice) to liquid (water) to gas (steam). conduct an investigation to observe the condensation of water. describe and/or identify examples of condensation, evaporation, melting, freezing of water. identify the uses of water in the home and at school.	2.3		
	apply the 2.1 science skills in the context of the content of this topic.	2.1		

Organizing Topic	Essential Knowledge, Skills, and Processes	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Investigating Magnets and Metal	**Students should be able to:**		Student demonstrations Classroom observations Student work Quizzes Tests	*Physical Science SOLutions* module: http://www.smv.org/pubs/index.html
	predict which materials will be attracted to magnets, test the predictions, and create a chart that shows the results, classifying materials as to whether they are attracted to magnets or not. compare natural magnets (lodestone or magnetite) and artificial magnets. identify the north and south magnetic poles of magnets. conduct an investigation to determine how the different poles of magnets react to the poles of other magnets. use magnetic compasses to determine the directions of north and south poles. identify important applications of magnets in everyday life, including • refrigerator magnets and chalkboard letters; • toys; • door latches; • paper clip holders. create a new application for using a magnet.	2.2		
	apply the 2.1 science skills in the context of the content of this topic.	2.1		

Organizing Topic	Essential Knowledge, Skills, and Processes	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Investigating Plant Resources	**Students should be able to:**		Student demonstrations Classroom observations Student work Quizzes Tests	*Project Learning Tree, K-8:* http://www.plt.org/ *VA Natural Resources Education Guide:* http://www.vanaturally.org/guide.html
	comprehend that plants produce oxygen and food. classify and identify the sources and uses of plant products, such as fiber, cotton, oil, spices, lumber, rubber, medicines, and paper. describe plant products grown in Virginia that are useful to people, including wood, fruits, and vegetables. List and classify plant products. compare and contrast different ways animals use plants as homes and shelters. construct and interpret a chart illustrating the plant foods consumed by different animals. construct and interpret a model that demonstrates how plants prevent soil erosion.	2.8		
	model the effects of weathering and erosion on the land surface.	2.7b		
	apply the 2.1 science skills in the context of the content of this topic.	2.1		

Organizing Topic	Essential Knowledge, Skills, and Processes	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Investigating Life Cycles	**Students should be able to:**		Student demonstrations Classroom observations Student work Quizzes Tests	
	describe changes in the life cycle of a frog and a butterfly. identify and describe changes in a plant from flower (blossom) to fruit. compare and contrast life cycles of a frog and a butterfly. construct and interpret models/diagrams of animal and plant life cycles.	2.4		
	apply the 2.1 science skills in the context of the content of this topic.	2.1		

Organizing Topic	Essential Knowledge, Skills, and Processes	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Investigating Habitats	**Students should be able to:**		Student demonstrations Classroom observations Student work Quizzes Tests	*Our Living Environment* teacher training module: http://www.doe.virginia.gov/VDOE/Instruction/OurLivingEnvironment.doc *Project WILD activity guide:* http://www.dgif.state.va.us/education/wildlife_education.html *Project Wild Aquatic* activity guide: http://www.projectwild.org/materials/materials.htm *Project Learning Tree:* http://www.plt.org/ *Project WET activity guide:* http://www.deq.state.va.us/education/wetinfo.html *VA Natural Resources Education Guide:* http://www.vanaturally.org/guide.html
	classify objects as to whether they are living or nonliving. describe the nonliving components of an organism's surroundings, including water, space, and shelter. (Shelter may be living or nonliving.) construct and interpret simple models of different kinds of habitats, including a forest and a stream.	2.5		
	compare and contrast different ways animals use plants as homes and shelters.	2.8c		
	predict and describe seasonal changes in habitat and their effects on plants and animals, for example, how trees change through the seasons and how animals respond to changes in the seasons. describe how animals are dependent on their surroundings, for example, how squirrels and other animals are affected by the loss of forest habitat.	2.5b		
	apply the 2.1 science skills in the context of the content of this topic.	2.1		